

REMARKS

Claim 1 has been amended to recite “a binder formed of styrene-butadiene rubber, which is in the form of fine particles having an average particle size of 10 to 500 nm and has a glass transition temperature of 0° C or lower.” Support is found, for example, on page 20, lines 24-25 and 30-33 of the specification as filed.

Claim 2 is canceled.

No new matter has been introduced. Entry and consideration of the amendments are respectfully requested.

Applicants respectfully request reconsideration of the withdrawal of claims 15 and 21. Applicants elected Species II (Claim 3, wherein the technical feature therein is directed to the amount of carbon fiber and SBR on the basis of the total amount of active substance, binder and carbon fiber). Claims 15 and 21 read thereon. For example, the embodiment of claim 3 is within the scope of claim 1 from which it depends, such that claim 1 reads on the elected Species. Claim 15 depending from claim 1 does not limit the amount of carbon fiber or the amount of binder formed of styrene-butadiene rubber, such that claim 3 is also within the scope of claim 15. Therefore, claim 15 also reads on the elected Species. The same also pertains to claim 21.

Response to Objection to the Specification

The abstract of the disclosure is objected to for containing the phrase “characterized.” The Abstract has been amended accordingly. Reconsideration and withdrawal of the objection are respectfully requested.

Response to Claim Rejection – 35 U.S.C. § 102

Claim 1 is rejected under 35 U.S.C. § 102(b) as being anticipated by JP 11-176442 to Otsuka et al. (“Otsuka”).

Applicant respectfully traverses the rejection.

Otsuka is cited as disclosing all the features of the claimed negative electrode material.

The rejection should be withdrawn because Otsuka does not disclose all the features of amended claim 1. Namely, Otsuka does not disclose a least “a binder formed of styrene-butadiene rubber, which is in the form of fine particles having an average particle size of 10 to 500 nm and has a glass transition temperature of 0° C or lower” as recited in amended claim 1.

Reconsideration and withdrawal of the rejection are respectfully requested.

Response to Claim Rejections - 35 U.S.C. § 103

Claim 3 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Otsuka as applied to claim 1 in view of U.S. Patent No. 6,998,192 (Yumoto) or U.S. Patent No. 6,037,095 (Miyasaka).

Applicant respectfully traverses the rejection.

Otsuka is cited as teaching in paragraph [0018] a weight ratio of mesophase black lead to carbon fiber in the range of 93:3 to 80:20 and preferably 95:5-90:10. The Examiner cites paragraph [0024] as teaching a weight ratio of 93:7, graphite to fiber.

The Examiner recognizes that the ratio of Otsuka is further mixed with an unspecified amount of SBR binder. The Examiner asserts that a skilled artisan would have envisioned the SBR binder amount as a result effective variable which provides sufficient tackiness at a lower amount of binder and thus a significantly greater active material ratio to the fiber and binder.

The Examiner cites Yumoto and Miyasaka as providing examples of electrode materials containing a SBR binder in an amount up to 5 wt% (Yumoto, col.1, lines 40-60) and 4 wt% (Miyasaka, col. 12, lines 45-50). The Examiner asserts that SBR binders in amounts of less than 6 wt% were commonly used in the art to provide a sufficient degree of binding while maximizing the amount of active material in the electrode and also improving the flexibility of the electrode material. The Examiner concludes that it would have been obvious to modify the teachings of Otsuka to limit the amount of SBR binder to a range of up to 5 wt% as suggested by Yumoto or Miyasaka.

The rejection should be withdrawn at least for the reason that Otsuka does not teach or suggest all the features of amended claim 1. Namely, Otsuka does not teach or suggest at least “a binder formed of styrene-butadiene rubber, which is in the form of fine particles having an average particle size of 10 to 500 nm and has a glass transition temperature of 0° C or lower” as recited in amended claim 1. Neither Yumoto nor Miyasaka cure such deficiency.

The rejection should be withdrawn at least for the additional reason that the present invention achieves unexpected results. In the present invention, using styrene-butadiene rubber (SBR) as claimed enables making SBR well coordinated with an electrolytic solution and improves low-temperature characteristics of the electrode as well as making SBR uniformly dispersed in a carbonaceous negative electrode active substance and attaining effective adhesion between the active substance particles. These results would not have been expected from the teachings of the cited references.

Reconsideration and withdrawal of the rejection are respectfully requested.

Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,


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